

HAND-CONTROLLED CIRCULAR SAW

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a circular saw, and more particularly to a hand-controlled saw having a motor linearly corresponding to a saw blade of the circular saw.

2. Description of Related Art

With reference to Fig. 1, a conventional circular saw in accordance with the prior art comprises a base member (50) having two guiding rods (51) mounted on a top of the base member (50). A sliding seat (60) is slidably mounted on the two guiding rods (51) and a motor (70) is laterally mounted on the sliding seat (60). A housing (80) is pivotally connected to the motor (70) and a saw blade (90) is laterally pivotally connected to the housing (80) and partially received in the housing (80). For easily driving the saw blade (90), the motor (70) perpendicularly corresponds to the saw blade (90).

However, the motor (70) laterally corresponds to a moving direction of the saw blade (90) such that the total width of the motor (70) and the housing (80) is lengthened. Consequently, the motor (70) and the housing (80) cover a great area when the saw blade (90) is moved to cut the workpiece. As a result, the user needs to prepare a great work place to prevent the motor (70) from bumping the articles beside the circular saw when the motor (70) is moved.

The present invention has arisen to mitigate and/or obviate the disadvantages of the conventional hand-controlled circular saw.

1 SUMMARY OF THE INVENTION

2 The main objective of the present invention is to provide an
3 improved circular saw that the saw blade and the motor linearly
4 correspond to each other.

5 To achieve the objective, the circular saw in accordance with the
6 present invention comprises a universal arm mounted to a rear end of a
7 base member of the circular saw. A housing with a saw blade is securely
8 connected to the universal arm. A drive device is longitudinally mounted
9 to the housing for driving the saw blade and includes a casing secured on
10 the housing. A motor is securely received in the casing and radially
11 corresponding to the saw blade along a moving direction of the saw blade.
12 A worm is longitudinally secured on a free end of the shaft extending from
13 the motor. A worm gear is laterally rotatably mounted to the casing and
14 engaged to the worm. An endless belt is mounted and surrounding a first
15 belt wheel extending from the saw blade and the second belt wheel
16 extending from the worm gear for driving the saw blade when the motor is
17 operated.

18 Further benefits and advantages of the present invention will
19 become apparent after a careful reading of the detailed description with
20 appropriate reference to the accompanying drawings.

21 BRIEF DESCRIPTION OF THE DRAWINGS

22 Fig. 1 is a perspective view of a conventional hand-controlled
23 circular saw in accordance with the prior art;

24 Fig. 2 is a perspective view of a hand-controlled circular saw in

1 accordance with the present invention;

2 Fig. 3 is a side plan view in partial cross-section of the circular saw
3 in Fig. 2;

4 Fig. 4 is a partially enlarged side plan view in partial cross-section
5 of the circular saw in Fig. 2;

6 Fig. 5 is a top plan view in partial cross-section of the circular saw
7 in Fig. 2; and

8 Fig. 6 is a partially enlarged top plan view in partial cross-section
9 of the circular saw in Fig. 2.

10 DETAILED DESCRIPTION OF THE INVENTION

11 With reference to the drawings and initially to Figs. 2 and 3, a
12 hand-controlled circular saw in accordance with the present invention
13 comprises base member (10), a universal arm (20) pivotally mounted to
14 the base member (10), a housing (30) with a saw blade (300) securely
15 connected to the universal arm (20) and a drive assembly (40)
16 longitudinally mounted to the housing (30) for driving the saw blade
17 (300).

18 The base member (10) includes a supporting seat (11) pivotally
19 mounted to a rear end of the base member (10) and two connecting rods
20 (12) upwardly extending from the supporting seat (11). The two
21 connecting rods (12) form a V-shape.

22 The universal arm (20) includes a first linkage set (21) and a
23 second linkage set (22) respectively pivotally connected to a
24 corresponding one of the two connecting rods (12) of the base member

1 (10). The first linkage set (21) and the second linkage set (22) correspond
2 to each other. The first linkage set (21) includes a first linkage (211)
3 having a first end pivotally connected to a free end of a corresponding one
4 of the two connecting rods (12) and a second end opposite to the first end
5 of the first linkage (211), and a second linkage (212) having a first end
6 pivotally connected to a second end of the first linkage (211) and a second
7 end opposite to the first end of the second linkage (212). The structure of
8 the second linkage set (22) is the same as that of the first linkage set (21)
9 and has a first linkage (221) pivotally connected to a corresponding one
10 the two connecting rods (12) and a second linkage (222) pivotally
11 connected to the first linkage (221) of the second linkage set (22). A
12 connector (23) is pivotally connected to the second end of each of the
13 second linkages (212, 222).

14 The housing (30) is longitudinally and pivotally connected to the
15 connector (23) and the saw blade (300) is pivotally laterally mounted to
16 the housing (30) and partially received in the housing (30). The housing
17 (30) is reciprocally circularly moved relative to the connector (23). The
18 saw blade (300) has a first belt wheel (301) laterally and centrally
19 extending therefrom. A handle (31) is formed on the housing (30) opposite
20 to the connector (23) for user to control the circular saw.

21 With reference to Figs. 4-6, the drive device (40) includes a casing
22 (41) securely connected to the housing (30). A motor (42) is securely
23 received in the casing (41) and radially corresponding to the saw blade
24 (300) along a moving direction of the saw blade (300). The motor (42)

1 includes a shaft (421) rotatably extending from the motor (42) and a worm
2 (422) longitudinally secured on a free end of the shaft (421). A worm gear
3 (423) is laterally rotatably mounted to the casing (41) and engaged to the
4 worm (422). The worm gear (423) has a second belt wheel (424) laterally
5 centrally extending from the worm gear (423). An endless belt (43) is
6 mounted and surrounds the first belt wheel (301) and the second belt
7 wheel (424). Consequently, the saw blade (300) rotates for cutting the
8 workpiece due to the belt (43), the worm gear (423) and the worm (422)
9 when the motor (42) is operated.

10 As described above, the hand-controlled circular saw in
11 accordance with the present invention has the following advantages.

12 1. The motor (42) of the present invention longitudinally
13 corresponds to a moving direction of the saw blade (300) such that the
14 total width of the motor (42) and the housing (30) is reduced to prevent the
15 motor (42) from bumping an article that is closed to circular saw.

16 2. The worm (422) and the worm gear (423) are further used as a
17 gear reducer for providing a fixed and powerful output.

18 3. All the elements of the drive assembly (4) are received in the
19 casing (41) such that noise of the circular saw is effectively reduced.

20 4. The universal arm (20) is universally moved such that the user
21 can conveniently operate the circular saw in accordance with the present
22 invention.

23 Although the invention has been explained in relation to its
24 preferred embodiment, it is to be understood that many other possible

- 1 modifications and variations can be made without departing from the spirit
- 2 and scope of the invention as hereinafter claimed.